DERWENT-ACC-NO: 2001-425067

DERWENT-WEEK: 200314

TITLE: Preparation of polymeric azo dyes useful in antireflective coatings involves contacting separate liquid phases of a diazonium salt and an organic polymer

INVENTOR: DING, S; GONZALEZ, E B ; KHANNA, D N ; SHAN, J

PATENT-ASSIGNEE: CLARIANT FINANCE BVI LTD[CLRN] , DING S[DINGI], GONZALEZ E B[GONZI], KHANNA D N[KHANI], SHAN J[SHANI], CLARIANT INT LTD[CLRN]

PRIORITY-DATA: 1999US-0413181 (October 6, 1999) , 2001US-0008656 (November 9, 2001)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
CN 1377389 A	October 30, 2002	N/A	000	C09B 069/10
WO 200125341 A1	April 12, 2001	E	036	C09B 069/10
US 6346361 B1	February 12, 2002	N/A	000	G03F 007/021
US 20020061473 A1	May 23, 2002	N/A	000	G03F 007/30
EP 1222233 A1	July 17, 2002	E	000	C09B 069/10
KR 2002033839 A	May 7, 2002	N/A	000	C09B 069/10

DESIGNATED-STATES: CN JP KR SG AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL
PT SE AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
CN 1377389A	N/A	2000CN-0813862	September 22, 2000
WO 200125341A1	N/A	2000WO-EP09294	September 22, 2000
US 6346361B1	N/A	1999US-0413181	October 6, 1999

US20020061473A1	Div ex	1999US-0413181	October 6, 1999
US20020061473A1	N/A	2001US-0008656	November 9, 2001
EP 1222233A1	N/A	2000EP-0969286	September 22, 2000
EP 1222233A1	N/A	2000WO-EP09294	September 22, 2000
EP 1222233A1	Based on	WO 200125341	N/A
KR2002033839A	N/A	2002KR-0704338	April 4, 2002

INT-CL (IPC): C08G063/91, C09B069/10 , G03F007/021 , G03F007/04 , G03F007/09 , G03F007/30

ABSTRACTED-PUB-NO: US 6346361B

BASIC-ABSTRACT:

NOVELTY - Coupling a diazonium salt (1) with an organic polymer (2) involves dissolving (1) and (2) in separate solvents to obtain liquid phases, and contacting the separate liquid phases of (1) and (2) for a time greater than or equal to the minimum reaction time required for reacting (1) and (2).

DETAILED DESCRIPTION - Coupling a diazonium salt (1) with an organic polymer (2) involves: (a) dissolving (1) and (2) in separate solvents to obtain liquid phases; and (b) contacting the separate liquid phases of (1) and (2) for a time greater than or equal to the minimum reaction time required for reacting (1) and (2). (2) has a weight average molecular weight from 500 - 2,000,000. INDEPENDENT CLAIMS are also included for the following: (i) production of an antireflective coating composition (A1) for use in photolithography, from an azo coupled polymer dissolved in a solvent; and (ii) formation of an image on a substrate involves: (A) coating (A1) on the substrate either before or after coating a photoresist composition; (B) heating the coated substrate to substantially remove the photoresist solvent; (C) imagewise exposing the photoresist composition; and (D) developing the exposed photoresist composition.

USE - In the preparation of azo dyes which are useful in antireflective coating compositions. The antireflective coating compositions are used in conjunction with photoresist materials in the production of microelectronic devices.

ADVANTAGE - The process enables an efficient and substantially complete chemical reaction to take place, without any side reactions or decomposition of the diazonium salt. Use of costly phase transfer catalyst is avoided.

ABSTRACTED-PUB-NO: US20020061473A

EQUIVALENT-ABSTRACTS:

NOVELTY - Coupling a diazonium salt (1) with an organic polymer (2) involves dissolving (1) and (2) in separate solvents to obtain liquid phases, and contacting the separate liquid phases of (1) and (2) for a time greater than or equal to the minimum reaction time required for reacting (1) and (2).

DETAILED DESCRIPTION - Coupling a diazonium salt (1) with an organic polymer (2) involves: (a) dissolving (1) and (2) in separate solvents to obtain liquid phases; and (b) contacting the separate liquid phases of (1) and (2) for a time greater than or equal to the minimum reaction time required for reacting (1) and (2). (2) has a weight average molecular weight from 500 - 2,000,000. INDEPENDENT CLAIMS are also included for the following: (i) production of an antireflective coating composition (A1) for use in photolithography, from an azo coupled polymer dissolved in a solvent; and (ii) formation of an image on a substrate involves: (A) coating (A1) on the substrate either before or after coating a photoresist composition; (B) heating the coated substrate to substantially remove the photoresist solvent; (C) imagewise exposing the photoresist composition; and (D) developing the exposed photoresist composition.

USE - In the preparation of azo dyes which are useful in antireflective coating compositions. The antireflective coating compositions are used in conjunction with photoresist materials in the production of microelectronic devices.

ADVANTAGE - The process enables an efficient and substantially complete chemical reaction to take place, without any side reactions or decomposition of the diazonium salt. Use of costly phase transfer catalyst is avoided.

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DETAILED DESCRIPTION - Coupling a diazonium salt (1) with an organic polymer (2) involves: (a) dissolving (1) and (2) in separate solvents to obtain liquid phases; and (b) contacting the separate liquid phases of (1) and (2) for a time greater than or equal to the minimum reaction time required for reacting (1) and (2). (2) has a weight average molecular weight from 500 - 2,000,000. INDEPENDENT CLAIMS are also included for the following: (i) production of an antireflective coating composition (A1) for use in photolithography, from an azo coupled polymer dissolved in a solvent; and (ii) formation of an image on a

substrate involves: (A) coating (A1) on the substrate either before or after coating a photoresist composition; (B) heating the coated substrate to substantially remove the photoresist solvent; (C) imagewise exposing the photoresist composition; and (D) developing the exposed photoresist composition.

USE - In the preparation of azo dyes which are useful in antireflective coating compositions. The antireflective coating compositions are used in conjunction with photoresist materials in the production of microelectronic devices.

ADVANTAGE - The process enables an efficient and substantially complete chemical reaction to take place, without any side reactions or decomposition of the diazonium salt. Use of costly phase transfer catalyst is avoided.

WO 200125341A

CHOSEN-DRAWING: Dwg.0/1

TITLE-TERMS: PREPARATION POLYMERISE AZO DYE USEFUL ANTIREFLECTIVE COATING
CONTACT SEPARATE LIQUID PHASE DIAZONIUM SALT ORGANIC POLYMER

DERWENT-CLASS: A13 A89 E14 G06 L03 P84 U11

CPI-CODES: A10-E; A12-E01; A12-L02B2; E21-B05; E21-C11; E21-C18; E24-B; G06-A;
G06-D06; G06-F03C; L04-C06;

EPI-CODES: U11-C04D; U11-C07D1;

CHEMICAL-CODES:
Chemical Indexing M4 *01*
Fragmentation Code
C316 F010 F012 F019 F021 F029 F100 F199 G001 G002
G003 G010 G011 G012 G013 G019 G020 G021 G022 G029
G030 G039 G040 G050 G100 G111 G112 G113 G221 G299
G553 G563 H1 H100 H102 H141 H401 H402 H403 H404
H481 H482 H483 H484 H600 H601 H602 H608 H609 H681
H682 H683 H684 H689 H713 H716 H721 H722 H723 J011
J012 J013 J171 J172 J173 J271 J272 J321 J322 J341
J342 J361 J362 J371 J372 J5 J581 J582 J583 K0
K352 K353 K399 K431 K442 K499 K5 K534 K810 K820

K830 K899 L145 L199 L620 L640 L650 L699 M121 M122
M123 M124 M125 M126 M129 M143 M149 M210 M211 M212
M213 M214 M215 M216 M220 M221 M222 M223 M224 M225
M226 M231 M232 M233 M262 M271 M272 M273 M280 M281
M282 M283 M311 M312 M313 M314 M315 M316 M321 M322
M323 M331 M332 M333 M340 M342 M344 M349 M362 M373
M381 M383 M391 M392 M393 M413 M414 M510 M520 M521
M522 M523 M531 M532 M533 M540 M541 M542 M543 M720
M904 M905 N104 N113 N152 N202 N272 N372 N421 N422
N511 N512 Q345 W001 W003 W030 W031 W032 W111 W124
W125 W132 W311 W323 W334 W410 W532
Ring Index
00012
Markush Compounds
200043-02301-K 200043-02301-P

ENHANCED-POLYMER-INDEXING:
Polymer Index [1.1]
018 ; G0022*R D01 D51 D53 E00*R E35 E30 D02 D11 D10 D12 D13*R D18*R
D19 D18 D22*R D31 D32 D33 D34 D35 D73 D74 D75 D76 D77 D78 D42 D54
D55 D58 D59 D60 D61*R D63 D69 D88 D89 D90 D91 D92 D93 D94 D95 F00
F04 F08 F07 F09 F10 F12 F16 F22 F23 F24 F27 F26 F28 F29 F31 F30
F32 F33 F34 F36 F35 F37 F38 F89 F41 F90 F91 F47 F61 F62 F64 F93
F70 F94 F95 F75 F77 1A*R N* 5A O* 6A 7A*R F* 7A D57 F44 ; H0000
Polymer Index [1.2]
018 ; G0022*R D01 D51 D53 E28 E00 E35 E30 D11 D10 D12 D13*R D14
D13 D18*R D22*R D31 D32 D33 D34 D35 D73 D74 D75 D76 D77 D78 D42
D54 D55 D57 D58 D59 D60 D61*R D63 D69 D84 D85 D86 D87 D88 D89 D90
D91 D92 D93 D94 D95 F00 F04 F08 F07 F09 F10 F12 F16 F22 F23 F24
F27 F26 F28 F29 F34 F36 F35 F37 F38 F89 F41 F90 F91 F47 F61 F62
F64 F93 F70 F94 F95 F77 1A*R N* 5A O* 6A 7A*R F* 7A F44 ; H0000
Polymer Index [1.3]
018 ; G0022*R D01 D51 D53 E00*R E35 E30 D02 D11 D10 D12 D13*R D18*R
D19 D18 D22*R D31 D32 D33 D34 D35 D73 D74 D75 D76 D77 D78 D42 D54
D55 D58 D59 D60 D61*R D63 D69 D88 D89 D90 D91 D92 D93 D94 D95 F00
F04 F08 F07 F09 F10 F12 F16 F22 F23 F24 F27 F26 F28 F29 F31 F30
F32 F33 F34 F36 F35 F37 F38 F89 F41 F90 F91 F47 F61 F62 F64 F93
F70 F94 F95 F75 F77 1A*R N* 5A O* 6A 7A*R F* 7A D57 F44 ; G0022*R
D01 D51 D53 E28 E00 E35 E30 D11 D10 D12 D13*R D14 D13 D18*R D22*R
D31 D32 D33 D34 D35 D73 D74 D75 D76 D77 D78 D42 D54 D55 D57 D58
D59 D60 D61*R D63 D69 D84 D85 D86 D87 D88 D89 D90 D91 D92 D93 D94
D95 F00 F04 F08 F07 F09 F10 F12 F16 F22 F23 F24 F27 F26 F28 F29
F34 F36 F35 F37 F38 F89 F41 F90 F91 F47 F61 F62 F64 F93 F70 F94

F95 F77 1A*R N* 5A O* 6A 7A*R F* 7A F44 ; G0022*R D01 D51 D53 E00*R E35 E30 D02 D11 D10 D12 D26 D27 D13*R D18*R D22*R D31 D32 D33 D34 D35 D73 D74 D75 D76 D77 D78 D42 D54 D55 D57 D58 D59 D60 D63 D69 D82 D83 D84 D85 D86 D87 D88 D89 D90 D91 D92 D93 D94 D95 F00 F04 F08 F07 F09 F10 F12 F22 F23 F24 F27 F26 F28 F29 F34 F36 F35 F37 F38 F44 F47 F61 F62 F64 F93 F70 F94 F95 F77 N* 5A O* 6A 7A*R F* 7A ; H0022 H0011 ; H0033 H0011 ; H0282 ; L9999 L2391 ; S9999 S1605*R ; M9999 M2835 ; L9999 L2835 ; P1730 P1694 D01 ; P0464*R D01 D22 D42 F47 ; P8082*R D01 D10 D11 D50 F07

Polymer Index [1.4]

018 ; B9999 B4400*R B4240 ; ND03 ; ND06 ; N9999 N5890 N5889 ; N9999 N6439 ; B9999 B5094 B4977 B4740 ; J9999 J2915*R ; J9999 J2971 J2915 ; ND01 ; K9574 K9483 ; K9676*R ; Q9999 Q7114*R ; N9999 N7147 N7034 N7023 ; N9999 N7090 N7034 N7023 ; B9999 B5447 B5414 B5403 B5276 ; Q9999 Q7330*R

Polymer Index [1.5]

018 ; A999 A475

Polymer Index [2.1]

018 ; P0226 P0282*R D01 D18 F30 ; M9999 M2095*R ; K9847*R K9790 ; L9999 L2391 ; L9999 L2095*R ; S9999 S1605*R

Polymer Index [2.2]

018 ; G0179 G0102 G0022 D01 D12 D10 D19 D18 D31 D51 D53 D58 D76 D88 F31 F30 ; H0000 ; H0011*R ; M9999 M2391 ; P1741

Polymer Index [2.3]

018 ; Q9999 Q8684 Q8673 Q8606 ; N9999 N6780*R N6655 ; N9999 N6860 N6655 ; N9999 N5889*R ; ND01 ; K9574 K9483 ; K9676*R ; Q9999 Q7114*R ; N9999 N7147 N7034 N7023 ; N9999 N7090 N7034 N7023 ; B9999 B5447 B5414 B5403 B5276 ; Q9999 Q7330*R

Polymer Index [2.4]

018 ; A999 A475

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C2001-128549

Non-CPI Secondary Accession Numbers: N2001-315370

DERWENT-ACC-NO: 1999-203937

DERWENT-WEEK: 199923

TITLE: Photoresist structure used in manufacture of semiconductors - includes a top antireflective coating layer comprising an indanone or glutarimide copolymer containing a diazo-naphthoquinone sensitiser

INVENTOR: AZUMA, T

PATENT-ASSIGNEE: TOSHIBA KK[TOKE]

PRIORITY-DATA: 1996US-0588085 (January 18, 1996)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
US 5879853 A	March 9, 1999	N/A	005	G03F 007/023

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
US 5879853A	N/A	1996US-0588085	January 18, 1996

INT-CL (IPC): G03C001/825, G03F007/023

ABSTRACTED-PUB-NO: US 5879853A

BASIC-ABSTRACT:

A multilayered structure used in manufacturing semiconductor devices comprises (a) a photoresist layer and (b) an antireflective layer of thickness <1000 Angstrom comprising an indanone or glutarimide copolymer, a solvent and an orthodiazonaphthoquinone sensitiser.

Preferably the copolymer contains a (meth)acrylate, vinyl, olefin, epoxy or alcohol monomer. The sensitiser is of formula (I)-(IV), where R, R1, R2 = H or (m)ethyl.

USE - In the lithographic manufacture of semiconductors.

ADVANTAGE - The top antireflective coating (TAR) layer has a suitable refractive index for the wavelength of the illumination light (e.g. 193 or 248 nm) and does not contaminate the interface between itself and the underlayer resist. The TAR material has high etch resistance and significantly reduces critical dimension variation in exposed photoresist films.

CHOSEN-DRAWING: Dwg.0/0

TITLE-TERMS: PHOTORESIST STRUCTURE MANUFACTURE SEMICONDUCTOR TOP ANTIREFLECTIVE
COATING LAYER COMPRISE INDANONE GLUTARIMIDE COPOLYMER CONTAIN DIAZO
NAPHTHOQUINONE SENSITIVE

DERWENT-CLASS: A89 E14 G06 L03 P83 P84 U11

CPI-CODES: A12-E07C; A12-L02B2; E10-A06B; G06-A02; G06-D06; G06-F03C; G06-F03D; L04-C05; L04-C06B;

EPI-CODES: U11-A06A; U11-C04A1H; U11-C04E1;

CHEMICAL-CODES:
Chemical Indexing M3 *01*
Fragmentation Code
G020 G021 G022 G023 G029 G221 H4 H401 H402 H441
H442 H541 H8 K0 K431 K432 K5 K533 L7 L722
M210 M211 M212 M240 M272 M280 M281 M282 M320 M414
M510 M520 M531 M540 M781 M903 M904 Q130 Q338 Q344
Q349 R043
Markush Compounds
199917-FR901-K 199917-FR901-U

ENHANCED-POLYMER-INDEXING:
Polymer Index [1.1]
018 ; G0260*R G0022 D01 D12 D10 D26 D51 D53 ; R00479 G0384 G0339 G0260 G0022 D01 D11 D10 D12 D26 D51 D53 D58 D63 D85 F41 F89 ; H0011*R ; M9999 M2084 ; M9999 M2335 ; M9999 M2095*R ; L9999 L2391 ; L9999 L2095*R ; P0088
Polymer Index [1.2]
018 ; H0022 H0011 ; G0022*R D01 D51 D53 G0340*R G0339 G0260 G0022

D12 D10 D26 D58 D63 F41 F89 G0384*R G1558*R F47 G0997*R F26 ; G1536 G1525 D01 F23 D21 D18 D32 D77 D50 D89 ; M9999 M2095*R ; L9999 L2391 ; L9999 L2095*R ; P0088

Polymer Index [1.3]

018 ; H0022 H0011 ; R00351 G1558 D01 D23 D22 D31 D42 D50 D73 D82 F47 ; G1536 G1525 D01 F23 D21 D18 D32 D77 D50 D89 ; M9999 M2095*R ; L9999 L2391 ; L9999 L2095*R

Polymer Index [1.4]

018 ; H0022 H0011 ; R00479 G0384 G0339 G0260 G0022 D01 D11 D10 D12 D26 D51 D53 D58 D63 D85 F41 F89 ; G1536 G1525 D01 F23 D21 D18 D32 D77 D50 D89 ; M9999 M2095*R ; L9999 L2391 ; L9999 L2095*R ; P0088

Polymer Index [1.5]

018 ; ND01 ; K9676*R ; K9483*R ; K9585 K9483 ; K9869 K9847 K9790 ; Q9999 Q8684 Q8673 Q8606 ; Q9999 Q7476 Q7330

Polymer Index [1.6]

018 ; R01740 G2335 D00 F20 H* O* 6A ; R00245 D01 D11 D10 D50 D82 F27 F26 ; R00270 D01 D11 D10 D50 D81 F27 F26 ; R04571 D01 D11 D10 D50 D67 D84 F16 F21 O* 6A ; A999 A475

Polymer Index [1.7]

018 ; D21 D18 D32 D78 D12 D10 D53 D51 D59 D90 D91 D92 D93 F98 F23 F34 F62 ; A999 A204

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C1999-059276

Non-CPI Secondary Accession Numbers: N1999-150209